

A banner featuring a bright sun in a blue sky with white clouds. The text 'WARM' is in orange, 'Hot Topics in' is in orange and green, and 'Solar Energy' is in green. A red diagonal line is drawn over the word 'Hot'.

WARM
~~Hot~~ Topics in
Solar Energy

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2009 CDIAC Solar Financing Seminar

Solar Energy

An idea whose time has
[finally] come?



Hurricane Katrina

Before-and-After Photographs

Glacier retreat in Patagonia





**The Economics
of a costly and
ultimately finite
source of
fossil fuels**

Recent History

1950's era – The solar cigarette lighter?

Companies, Scientists Focus on New Solar Products and Processes

Sun Runs Radio, Clock, Lighter,
Vanguard Voice; Furnace
Will Test Missile Materials

BY R. W. BENEDICT AND D. O. IVES
Staff Reporters of THE WALL STREET JOURNAL

CLOUDCROFT, N. Mex.—Next month a strange 15-story structure will begin rising on a lonely mountain five miles north of here. Its purpose: To trap and concentrate the enormous energy of the sun's rays to fire a super-hot furnace for testing materials going into future missiles, manned space craft and nuclear reactors.

Across the country, at Lexington, Mass., the Massachusetts Institute of Technology recently unveiled another unusual structure. Soon to be put on the market, it's an experimental three-bedroom house that will get most of its winter heat and all of its hot water supply from the sun.

And out in space the Navy's tiny Vanguard satellite is sending some of its signals back to Earth from a transmitter that gets its power from the sunshine striking the speeding sphere.

Step-up in Solar Products

The \$10 million furnace being built for the Air Force, the suburban home (price not yet announced) and the satellite-radio's novel power system join a lengthening list of products and processes using solar power in place of, or to supplement, conventional energy. The step-up in solar energy applications, say scientists, advances the day when the sun may heat and cool many of the nation's homes, cook and refrigerate food and, perhaps, supply power to run things as diverse as household appliances and space ships.

Already, the sun is providing the main source of heat for at least nine U.S. houses and auxiliary heat in scores of additional homes, as well as providing hot water for thousands of households in Florida and California. Solar energy also cooks meals for families in such countries as Mexico and India, fires some 35 furnaces used by industrial and military researchers and powers a growing number of consumer products, including radios, clocks and cigaret lighters.

"The one energy resource we have in abundance is solar energy," says John I. Yellott, executive director of the Association for Applied Solar Energy, Phoenix, Ariz., an international organization of manufacturers, research laboratories and individual scientists interested in solar energy. "To date," continues Mr. Yellott, "we have made virtually no use of this resource in this country because of ample supplies of fossil fuels (coal and oil). But this era is now ending, and the sun is going to have to furnish directly a growing share of our rapidly rising energy needs."

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Costly "Collectors"

The sun bombards a city the size of Dallas with more energy in one day than is released by the explosion of a hydrogen bomb, solar scientists say. The catch, of course, is that huge and costly "collectors" are necessary to trap and utilize the enormous flood of energy.

Despite the lure of low fuel bills, home-seekers probably won't stampede to buy solar houses such as the M.I.T. experimental model. Reason: Its solar heating system costs "about six times as much as a conventional system giving equal comfort," says one of the designers of the Lexington house. But solar engineers believe costs will be cut and sun-operated heating and cooling systems will be a big factor in the home-building industry within 20 years.

The Lexington house, from three sides, looks like any new house of contemporary design, except that it's somewhat higher than most. On the south side, however, the entire visible side and roof is a huge 640-square-foot area of opaque glass with aluminum plating and pipes inside. The sun's rays are trapped by the glass and aluminum. Water in the pipes absorbs the heat, carrying it to a 1,500-gallon storage tank in the basement.

A heat exchanger transfers the heat from the water to air that is circulated throughout the house. The system can store enough heat to take care of about three successive cloudy days. An oil heater is provided to take over during longer periods of cloudiness.

Needed: Pioneer Buyers

"To get solar heating off the ground, manufacturers may have to lose money for awhile, or depend on a few pioneer buyers to lead the way, as with color television," says Dr. George O. G. Lof, a solar energy consultant who himself occupies a \$45,000 sun-heated home in a suburb of Denver, Colo. He believes mass production of solar heating systems might whittle their price to a level about

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California leads the nation in solar energy production and public policy

US Department of Energy designates 6 cities as "Solar America Cities"

- Berkeley
- Sacramento
- San Diego
- San Francisco
- San Jose
- Santa Rosa

For more info: <http://www.solaramericacities.energy.gov/Home.aspx>

In other headlines...

- Price of Solar Panels dropping (Wall Street Journal, September 8, 2009)
- US Government doles out \$502 Million for wind and solar power
 - 2,000 jobs
 - 850 Megawatts (equivalent to 500,000 homes)

Current Updates

- Sonoma County Solar Assessment District
 - September 75 parcels for over \$4MM
- City of San Francisco Solar programs
 - GoSolarSF (388 installs=1.2MW)
 - Special Tax program
- City of San Diego
- Others?

Current Updates

Legislative updates

- SB 279 – adds *energy efficiency, water conservation*, and renewable energy to CFD
> October 10 veto or not!
- Others?

But, local energy production is only part of the story...

A holistic public policy program should also include:

- Electrical efficiency
- Gas energy efficiency (the carbon dioxide "gorilla")
- Water efficiency

Energy Efficiency (EE) offers the highest financial return and greenhouse gas reduction

But, local energy production is only part of the story...

- TIME[®] magazine hails EE as “A renewable energy resource that is perfectly clean, remarkably cheap, surprisingly abundant and immediately available.”
- In 2005, the CPUC and CEC’S EAP II declared: “[The} goal is for California’s energy to be adequate, affordable, technologically advanced, and environmentally sound...[C]ost effective energy efficiency is the resource of first choice for meeting California’s energy needs. Energy efficiency is the least cost, most reliable, and most environmentally-sensitive resource, and minimizes our contribution to climate change.”
- Resource - www.CaliforniaEnergyEfficiency.com

Just one example of efficiency

Silicon Valley Water Conservation Awards

- Applied Materials, Inc.
- High and low tech solutions
- Saving 40 million gallons of water per year

More Perspectives on EE

- Recent headline: Leading the way in EE: China
- September 16, 2009 CEC Board to approve:
 - City of Los Angeles \$3MM program for induction lamps
 - Town of Hillsborough \$1MM program for efficient water pumps
- California Solar Initiative Handbook Section 2.3
 - Effective July 1, 2009, must conform to certain EE standards in order to receive CSI Incentive

Program Perspectives

- Regional vs. customized city vs. “franchised” approach?
- Right sizing PV with EE
- Other programs including loans, rebates, etc.
- How can State and Federal dollars leverage our local programs?

Sample Local Programs

- SMUD Rebate program
Encourages replacement of high energy use equipment, with rebates and financing
http://www.smud.org/en/rebates/Documents/finance_factsheet.pdf
- Long Island green homes
Benefit assessment financing for energy efficiency up to \$12K per home
<http://ligreenhomes.com/page.php?Page=home>
- Lease programs – Solar City and others

Sample Local Programs

Portland

- Loan programs commencing
- City Council approves “Clean Energy Works Portland” Program
 - Energy retrofit program, costs paid back via utility bill

Seattle

Residential energy efficiency program in the making

Sample Local Programs

Chicago

Climate Action Plan 2020 umbrella framework

- One goal is to retrofit thousands of homes
- Revolving loan fund program commencing
- Link to good summary of program

http://www.brookings.edu/~media/Files/rc/papers/2009/0723_arra_chicago_retrofit/0723_arra_chicago_retrofit_profile.pdf

Sample Local Programs

San Diego Gas & Electric “On Bill” financing program

- Energy efficiency financing for business customers

http://sdge.com/business/esc/promo_obf.shtml

Sample Local Programs

San Francisco

“Green Loan Program”

A la CFD Special Tax Model

- Focus on EE, water conservation, and renewables
- First step - an energy and water use audit
- Block grant funds plus private capital

Federal Item

- Efficiency and Conservation Block Grant (EECBG) Program
US DOE offers \$2.7Billion Energy
- Develop and implement projects to:
 - Improve energy efficiency
 - Reduce energy use
 - Reduce fossil fuel emissions
- July 24, 2009 first wave of grants approved

Federal Item

- CREBs and QECCBs
- QECCBs offer opportunity:
 - Capital to improve energy efficiency
 - Green and solar community programs
 - Education campaigns on energy efficiency
- More info from IRS Notice 2009-29

Other Hot Topics

- Recent HOT developments?
- State level programs – Jan Mc Farland